



National Defense Center for Energy and Environment



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Installations, Energy and
Environment

Harmonizing Title V, PSD, and Air Emissions Inventories with EPA Mandatory Reporting for Greenhouse Gases at Fort Benning

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Presentation Outline

- Fort Benning air emissions overview
- Historic perspective of inventories preparation
- Why harmonize with Environmental Protection Agency (EPA) greenhouse gas (GHG) reporting rule?
- The emissions harmonizing process
- Example combustion unit
- Conclusions

Air Emissions Overview

- Title V Operating Permit
 - New Source Performance Standards (NSPS)
 - Hazardous Air Pollutant (HAP) major source
- Major source under Prevention of Significant Deterioration (PSD)
- EPA GHG mandatory reporting rule
- Executive Order 13514
- Georgia Environmental Protection Division (EPD) emissions inventory (fee determination)
- U.S. Army inventory requirements

Emissions Inventories Recent History

Inventory	2006	2007	2008	2009	2010 +
Criteria & HAP	Enviance	Contractor (excel)	Contractor (excel)	Contractor (excel)	Enviance
Title V Emission Caps	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Enviance
PSD Significance Thresholds	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Enviance
Greenhouse Gas		Enviance TCR Protocol			Enviance EPA Protocol
EO13514 Scope 1 GHG			Enviance CEQ/EPA Protocol	Enviance CEQ/EPA Protocol	Enviance CEQ/EPA Protocol
EO13514 Scope 2 GHG			Enviance CEQ Protocol	Enviance CEQ Protocol	Enviance CEQ Protocol

Combustion Units Emissions Methods

Inventory	Emission Factor (EF) Source	EF Units of Measure (UOM)	Raw Data Source and UOM	Reporting or Emissions Limit UOM
Criteria & HAP	AP-42	Gas: lb/mm scf Oil: lb/ 1000 gal	Gas: Meter (cscf) Oil: Used (gal) Monthly	Criteria: TPY HAPs: lb/year & TPY
Title V Emission Caps	AP-42	Gas: lb/mm scf Oil: lb/ 1000 gal	Gas: Meter (cscf) Oil: Used (gal) Monthly	Criteria: TPY, Rolling 12 Month Sum
PSD Significance Thresholds	Georgia EPD	Lb/mm Btu, Btu/hr, Operating Hours	Gas: Meter (cscf) Oil: Used (gal) Monthly	TPY via Hr / Year
Greenhouse Gas	40 CFR Part 98 Subpart C	Enviance TCR Protocol	Gas: Meter (cscf) Oil: Used (gal) Monthly	Metric Tons / Year CO ₂ e

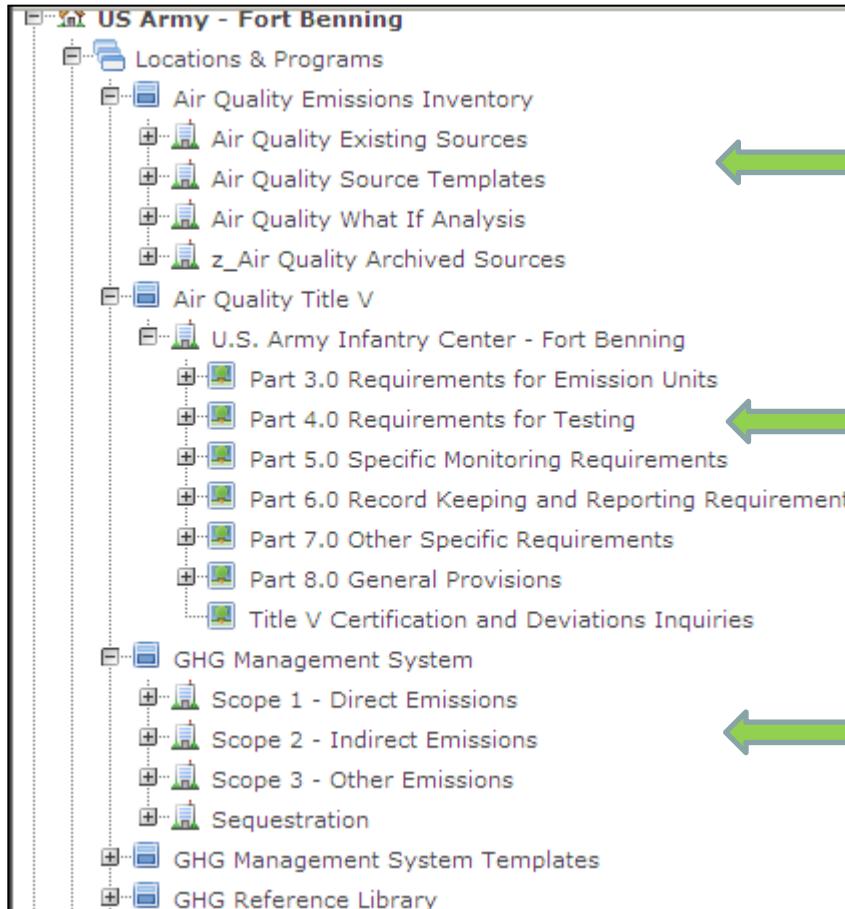
Why Harmonize Emissions Calculations?

- Long term program continuity
 - Multiple spreadsheets on various computers
 - Staff turnover
 - No “institutional memory” of methods
- Consistency
 - Single data source (meter readings, e.g.) could drive 5 calculation sets
- Efficiency
 - Data collection and entry simplified
- Transparency
 - Key sustainability/stakeholder component

The Emissions Harmonizing Process

- Agreement with Georgia EPA
 - PSD significance threshold
 - Criteria inventory
 - Title V limits
- Use raw data from its source
 - Meter readings (Hundreds scf) monthly
 - As opposed to pre-processing in excel spreadsheets
- Map single data entry to all dependent calculations
- Preserve previous methods
- One-time report configuration allows ongoing output

File Organization in EMIS



Criteria, HAPs, and PSD calculations

Title V Permit Conditions
(Including limit calculations)

GHG calculations

Use raw data from its source

The screenshot shows a software application window with a blue header bar containing tabs: Home, Calendar, Messages, Tasks and Workflows, and Setup. The Home tab is selected. Below the header is a toolbar with icons for file operations. The main area is divided into two sections: 'System Models' on the left and 'Applicable Requirements' on the right.

System Models:

- Air Quality Existing Sources
 - Construction Activities
 - Engine Test Cells
 - Engine Testing
 - Fire Fighter Training Exercises
 - Fuel Transfer
 - Fueling Operations
 - Heating Units
 - _Fuel Use Data Entry
 - H008
 - H010
 - H011

Applicable Requirements:

US Army - Fort Benning > Air Quality Emissions Inventory

+ Search

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Select	Name ▲
<input type="checkbox"/>	# <u>Meter Reading H008 Hundreds scf</u>
<input type="checkbox"/>	# <u>Meter Reading H010 Hundreds scf</u>
<input type="checkbox"/>	# <u>Meter Reading H011 Hundreds scf</u>

Arrows point from the '_Fuel Use Data Entry' node in the System Models tree to the H008, H010, and H011 nodes in the tree below it. Arrows also point from the H008, H010, and H011 nodes in the System Models tree to their corresponding requirement entries in the Applicable Requirements table.

Map raw data to drive emissions calculations

The screenshot shows a software interface for managing system models. On the left, a tree view titled "System Models" shows the "US Army - Fort Benning" model. Under "Locations & Programs", the "Air Quality Emissions Inventory" is expanded, revealing "Air Quality Existing Sources" which contains "Construction Activities", "Engine Test Cells", "Engine Testing", "Fire Fighter Training Exercises", "Fuel Transfer", "Fueling Operations", and "Heating Units". The "Heating Units" node has a child node "_Fuel Use Data Entry" and several sub-nodes labeled H008, H010, H011, H018, H019, H020, H021, H022, H023, and H024. Two curved black arrows point from the "H008" and "H010" nodes towards the right-hand data list. On the right, a table lists various data items under the columns "Select" and "Name". The "Name" column contains numerous entries related to fuel usage and emissions, such as "12 Month Rolling Distillate Fuel Oil Usage", "12 Month Rolling Natural Gas Usage", "Annual Arsenic Emissions", "Annual Arsenic Emissions (FO Combustion)", "Annual Arsenic Emissions (FO Combustion) (Tons)", "Annual Arsenic Emissions (NG Combustion)", "Annual Arsenic Emissions (NG Combustion) (Tons)", "Annual Arsenic Emissions (Tons)", "Annual Benzene Emissions", "Annual Benzene Emissions (Tons)", "Annual Beryllium Emissions", "Annual Beryllium Emissions (FO Combustion)", "Annual Beryllium Emissions (FO Combustion) (Tons)", "Annual Beryllium Emissions (NG Combustion)", "Annual Beryllium Emissions (NG Combustion) (Tons)", and "Annual Beryllium Emissions (Tons)".

Select	Name ▲
<input type="checkbox"/>	12 Month Rolling Distillate Fuel Oil Usage
<input type="checkbox"/>	12 Month Rolling Natural Gas Usage
<input type="checkbox"/>	Annual Arsenic Emissions
<input type="checkbox"/>	Annual Arsenic Emissions (FO Combustion)
<input type="checkbox"/>	Annual Arsenic Emissions (FO Combustion) (Tons)
<input type="checkbox"/>	Annual Arsenic Emissions (NG Combustion)
<input type="checkbox"/>	Annual Arsenic Emissions (NG Combustion) (Tons)
<input type="checkbox"/>	Annual Arsenic Emissions (Tons)
<input type="checkbox"/>	Annual Benzene Emissions
<input type="checkbox"/>	Annual Benzene Emissions (Tons)
<input type="checkbox"/>	Annual Beryllium Emissions
<input type="checkbox"/>	Annual Beryllium Emissions (FO Combustion)
<input type="checkbox"/>	Annual Beryllium Emissions (FO Combustion) (Tons)
<input type="checkbox"/>	Annual Beryllium Emissions (NG Combustion)
<input type="checkbox"/>	Annual Beryllium Emissions (NG Combustion) (Tons)
<input type="checkbox"/>	Annual Beryllium Emissions (Tons)

Preserve Previous Methods

The screenshot shows a software interface for managing system models. On the left, a tree view lists various models under 'System Models'. One node, 'US Army - Fort Benning', is expanded, showing sub-categories like 'Locations & Programs', 'Air Quality Emissions Inventory', 'Air Quality Title V', 'GHG Management System', and 'Scope 1 - Direct Emissions'. Under 'Scope 1 - Direct Emissions', several items are listed, including 'H008' which is highlighted with a red box and has a black arrow pointing from it to the 'Calculation Definition' table below. Other items include H010, H011, H018 and H019, H020, H021, and H022, H023 and H024, Natural Gas Combustion NOS, and Peak Shaving Plant. The 'Calculation Definition' table is located on the right side of the screen. It contains two rows of data:

Select	Action	Begin Date	End Date	Script
<input type="checkbox"/>	Edit	1/15/2010 12:00 AM		Calculation Definition: $((\text{Meter Reading H008_Hundreds scf}) - \text{PREV}((\text{Meter Reading H008_Hundreds scf}))) * 100$ Exceptions: None given
<input type="checkbox"/>	Edit	1/1/2000 12:00 AM	1/1/2010 12:00 AM	Calculation Definition: [Monthly Natural Gas Usage H008_mm scf] * 1000000 Exceptions: None given

Historical calculation capability allows former methods to be used for legacy data

Report on Ongoing Basis

1	U. S. Army Infantry Center - Fort Benning				
2	Fort Benning, Georgia 31905				
3	Permit Numbers 9711-215-0021-V-02-0 and 9711-215-0021-V-02-1				
4	Facility AIRS Number: 04-13-215-0021				
5	Attachment 1 - Semiannual Compliance Report				
6	Report Period:				
7					
8	Permit and Condition Number	Month Ending	Permit Limit	Actual 12-Consecutive Month Sum	Unit of Measure
9	3.2.3	07/31/2010	379.8	1.211	million cubic feet
10	3.2.3	08/31/2010	379.8	1.211	million cubic feet
11	3.2.3	09/30/2010	379.8	1.211	million cubic feet
12	3.2.3	10/31/2010	379.8	1.211	million cubic feet
13	3.2.3	11/30/2010	379.8	1.211	million cubic feet
14	3.2.3	12/31/2010	379.8	1.294	million cubic feet
15	3.2.4	07/31/2010	630,800	195,469	gallons
16	3.2.4	08/31/2010	630,800	195,469	gallons
17	3.2.4	09/30/2010	630,800	195,469	gallons
18	3.2.4	10/31/2010	630,800	195,469	gallons
19	3.2.4	11/30/2010	630,800	195,469	gallons
20	3.2.4	12/31/2010	630,800	266,063	gallons
21	3.2.5	07/31/2010	1,000,000	0	gallons
22	3.2.5	08/31/2010	1,000,000	0	gallons
23	3.2.5	09/30/2010	1,000,000	0	gallons
24	3.2.5	10/31/2010	1,000,000	0	gallons
25	3.2.5	11/30/2010	1,000,000	0	gallons
26	3.2.5	12/31/2010	1,000,000	0	gallons



Report Page 1

Attachment 1

Sheet3

Semi Annual Compliance

Compliance Data for Title

Direct output from Enviance EMIS

Example of limit calculations for Title V Compliance Semi Annual Report

Conclusions

- Actual cost savings realized
 - FY11 funding released by Air Program (\$50K), not requested for FY12
 - FY11 funding planned for PSD analysis being reallocated
- Simplified data entry
- Standard calculation methods
- Consistent calculations basis
- Program “memory” built into system
 - Will greatly assist future air program managers
 - Eliminates multiple excel spreadsheets
- Produces all required regulatory reports



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